

May 9, 2018

Ex Parte

Ms. Marlene H. Dortch

Secretary

Federal Communications Commission

445 12th Street, SW

Washington, DC 20554

Re: *Advanced Methods to Target and Eliminate Unlawful Robocalls, CG Docket No. 17-59*

On May 8, 2018, I met with Eric Burger of the Office of the Office of Strategic Planning and Policy Analysis regarding the recent conclusion of the NANC CATA working group. We discussed my submission as a minority report to the working group, attached. As noted in the report, economic incentives and historical precedents for other Internet security technologies make it unlikely that STIR/SHAKEN calling number authentication will be deployed at sufficient scale without a firm deadline and mandate. My submission to the CATA working group thus recommended a Commission-enforced deadline of one year for carriers using VoIP.

Pursuant to Section 1.1206(b)(1) of the Commission's rules, I am submitting this ex parte notice letter into the above-referenced docket over the Electronic Comment Filing System.

Sincerely,



Henning Schulzrinne

Julian Clarence Levi Professor of Computer Science

Minority Report on Selection of Governance Authority and Timely Deployment of SHAKEN/STIR

NANC Call Authentication Trust Anchor Working Group

Minority Report on Selection of Governance Authority and Timely Deployment of SHAKEN/STIR

1 Introduction

This minority report provides alternative recommendations to those provided in Sections 3.2.2 (“STI-GA Board Selection Process”) and Section 5.1 (“Milestones”) of the majority report, motivated by the desire to accelerate the deployment and use of STIR/SHAKEN and to ensure that all relevant and affected stakeholders are included in the governance of its deployment.

2 STI-GA Board Selection Process

The Secure Telephone Identity eco system affects carriers, as implementors, but its goal is to protect consumers against unwanted robocalls. The STI-GA is the only on-going policy-making entity in this space, except for the FCC itself. It will likely determine who gets to sign calls, which entities need to report what kind of information to whom and with what frequency (Section 5.1 of the Report), which CAs get authorized and how soon all the various components are put in place and start to perform their assigned duties. All of these affect the speed, efficacy and efficiency of implementing STIR/SHAKEN and thus the timing of when consumers will experience relief from unwanted robocalls. This is particularly true if the FCC takes a hands-off approach and leaves implementation of STIR/SHAKEN to industry.

In the future, entities other than carriers, such as large enterprises, may want to or need to sign calls, as they may be using multiple VoIP carriers and place, with the permission of the customer currently holding the number, outbound calls on behalf of that customer. For example, outbound call centers and notification and alerting services may use the number of the airline, school district or doctor’s office they are placing calls on behalf of. Unfortunately, all of the proposed board members have a potential conflict of interest, as they may prefer to offer such services themselves. *Thus, the STI-GA should include a representative reflecting the interest of large telephony users.*

Consumers are both directly affected and have a stake in the policy decisions of the STI-GA. For example, decisions of the STI-GA will affect how soon STIR/SHAKEN is widely implemented, the type of reporting required by other entities, such as the STI-PA, STI-CAs and the carriers. (The STI-GA, STI-PA, STI-CAs will have no direct knowledge of the volume of calls signed, for example, and would have to require such reporting by imposing it as an obligation on recipients of certificates.) Longer term, the STI-GA may affect, through its policy requirements, the level of assertions provided, and whether and when non-carrier entities can sign calls. Having consumers represented on the board ensures that they can be heard and

participate in decision making. Such participation also adds credibility to an organization that, after all, only exists to protect consumers. The state utility commissions serve, inter alia, to protect the interests of consumers in their jurisdictions.

There are several possible organizations that could nominate such board members. We propose to have two non-carrier board members: one board member nominated by NARUC and one by the consumer group members of the FCC Consumer Advisory Committee or drawn from one of the consumer entities that have been most active in this area (e.g., Consumers Union).

Since there are no technical qualifications to serve on the board (e.g., an engineering degree or evidence of technical knowledge), beyond a general understanding of the functioning of the overall STIR/SHAKEN system, it is likely that the board members nominated by the various industry associations and any consumer organizations are similarly qualified.

3 Deployment of the SHAKEN Certificate Framework

STIR/SHAKEN are a key component of the overall system to protect consumers against unwanted robocalls. The mechanism comes into play in two ways: If all or almost all domestic calls are signed, any unsigned domestic calls are likely to be unwanted, and thus consumers or carriers acting on their behalf may summarily reject such calls, even if the number has not yet been flagged. (Since spoofing allows rapid change of numbers by bad actors, blacklists of unsigned numbers are likely to be only modestly effective.) This is similar how techniques like SPF and DKIM protect against spam or phishing by entities impersonating another email address.

Secondly, if unwanted callers do sign their calls, calls can be rejected based on blacklists or can be more easily traced back to the originating carrier, e.g., to facilitate enforcement actions by FTC or FCC.

However, both approaches only work if almost all calls outside the carriers own network are signed. (Since almost all unwanted calls originate as VoIP calls, it is sufficient if the gateway provider validates the signature before converting the call to TDM.) This is noted in the December 7, 2017 letter from Kris Monteith to the NANC: “For call authentication to effectively and reliably authenticate calls, a substantial majority of calls – and thus significant number of providers – will need to participate in the system.”

The letter also calls for a “reasonable timeline or set of milestones for adoption and deployment of a SHAKEN/STIR call authentication system”. Unfortunately, the report declines to provide such a timeline or set of milestones, beyond a set of goals for the establishment of the GA.

Once almost everyone signs calls, any hold-out carriers will be incentivized to also sign their call since they would otherwise risk that many of their customers’ calls will be rejected, putting the hold-out carrier at a competitive disadvantage. On the other hand, there is almost no economic incentive to be among the first carriers to sign calls, as everybody else will have to

treat signed and unsigned calls as equally valid. Signing calls also does not protect the signing carrier's own customers from unwanted robocalls – it only protects the called parties served by other carriers. If carriers do not have a specific timeline for implementation, the diverse set of VoIP equipment and software vendors will similarly not prioritize implementation. An industry-wide mandate is likely to focus implementation efforts. (Fortunately, since Canada is mandating implementation of STIR/SHAKEN by March 31, 2019¹, many of the equipment vendors will already be implementing related features in their software to serve their Canadian customers.)

Thus, without a mandate, it is quite likely that we will never, or only with long delays, achieve sufficient deployment to fulfill the promise of STIR/SHAKEN. Indeed, the CATA Report does not offer any estimates of an implementation timeline for STIR/SHAKEN.

This dynamic is not new and we have experienced similar deployment problems in at least three other security-related areas. For example, for many years, technical experts have recommended that ISPs implement source address validation (SAV) or network ingress filtering, to prevent common classes of amplification attacks (BCP 38, May 2000). The FCC CSRIC III recommended implementation in March 2012. However, as the benefit of SAV primarily accrues to the Internet at large, a significant number of carriers² still have not implemented it (CAIDA Spoofer³), more than twenty years after the initial recommendation (RFC 2267).

Similarly, DKIM⁴ (published 2009) and SPF (published in 2006) are two email technologies that are somewhat analogous to STIR/SHAKEN. They make it difficult for unauthorized third parties to originate email appearing to come from the domain implementing SPF or DKIM. This protects the recipient against spoofed email, often used to launch a phishing attack. Unfortunately, since the benefits accrue mostly to the recipient, implementation has been uneven. Based on that experience, DHS has made implementation mandatory for federal agencies⁵, e.g., with an SPF or DKIM implementation timeline of 90 days after issuance of the directive and validation within one year. This has increased participation from 20% in May 2016 to 47% in December 2017⁶.

¹ See Canadian Radio-Television and Telecommunications Commission, *Compliance and Enforcement and Telecom Decision CRTC 2018-32*, January 2018.

² For example, 22% of autonomous systems did not implement BCP 38 in April 2018. See <https://spoofer.caida.org/summary.php>.

³ See <https://www.caida.org/projects/spoofer/>

⁴ “DKIM allows an organization to take responsibility for a message in a way that can be verified by a recipient.”, RFC 5885, July 2009. Available at <https://tools.ietf.org/html/rfc5585>

⁵ See DHS *Binding Operational Directive 18-01*, Oct. 16, 2017. Available at <https://cyber.dhs.gov/bod/18-01/>

⁶ See “DMARC Email Security Adoption Grows in U.S. Government”, eWeek January 2, 2018. Available at <http://www.eweek.com/security/dmarc-email-security-adoption-grows-in-u.s.-government>.

Third, RPKI (BCP 185⁷), used to protect the integrity of routing, has also suffered from slow deployment.

Concerns have been expressed that small carriers will not be able to handle the additional responsibility. However, most of these small carriers will use third party service providers to gateway long-distance calls, including VoIP calls, and thus can delegate the responsibility to those large entities. As noted, signing is mainly a concern for VoIP-originated calls, as almost all unwanted robocalls originate as VoIP calls, and are extremely unlikely to originate from within a rural small carrier using TDM.

Thus, we recommend three steps that will accelerate deployment:

1. Ensure that all carriers that route calls between originating and terminating carriers, such as long-distance providers and least-cost routers, do not remove or alter the STIR SIP header fields.
2. If the number of calls signed reaches a predetermined fraction (e.g., 50%), caller ID CNAM strings should be marked with a suitable prefix to indicate validated, unvalidated and spoofed numbers.
3. Third, signing and validation of all VoIP calls, for large carriers, should be mandatory within a period of no more than one year after completion of the NANC CATA report. Such a period exceeds that granted to Canadian carriers by the CRTC and exceeds, by more than a year, the implementation timeline indicated in the October 2016 Robocall Strikeforce⁸ report.

Given the inherent time required for any FCC action, the contributors of this minority report thus recommend commencing such a rulemaking as soon as possible.

The Report contains no evidence that any of the encouragements offered are either feasible, implementable in any reasonable time period or likely to provide the necessary incentives to achieve near-universal deployment. For example, it is likely that only Congress, not the FCC, can provide legal immunity as proposed in Section 5.2. The nature of the financial incentives is left unspecified; since we are close to implementation of bill-and-keep, it is not clear who would set rates for unvalidated calls. Re-opening the intercarrier compensation rule making seems unlikely to yield results in time frames that are acceptable. Given that VoIP calls are exchanged based on contracts, not tariffs, carriers could, today, impose a surcharge on unsigned calls, without any FCC action.

⁷ BCP 185, *Origin Validation Operation Based on the Resource Public Key Infrastructure (RPKI)*, Jan. 2014. Available at <https://www.rfc-editor.org/bcp/bcp185.txt>.

⁸ See *Robocall Strike Force Report*, Oct. 26, 2016. Available at <https://transition.fcc.gov/cgb/Robocall-Strike-Force-Final-Report.pdf>

Mandates discussed above could be rendered unnecessary if the largest providers of consumer VoIP services as well the major operators of commercial VoIP gateway services were to voluntarily set a sufficiently expeditious deadline for implementation by large carriers.